

REMARKS

Claims 1-18 are pending in the application and were rejected.

Claim 1, item b, uses the term “supplementing” however, this term is not described in the specification. The Examiners attention is called to page 6 lines 5-21, wherein there is a discussion of supplementing the distribution of input colors by a distribution of important colors. This discussion clearly sets forth the supplementing process and Applicants believe that the term supplementing as set forth in step (b) of claim 1 would be understood by one skilled in the art after reviewing this paragraph. Claims 1-5, 15 and 17 have been amended to change the term important colors to “pre-defined important colors”, as will be discussed later. The rejection of claim 1 under 35 U.S.C. §112 should be removed.

By this amendment, the specification has been amended to reflect the serial number of a related case.

The Examiner provisionally rejected claims 1-12, 14-18 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending Application No. 09/900,564. Enclosed is a terminal disclaimer which should remove the double patenting rejection on all of the above claims.

The Examiner rejected claims 1-2, 5, 9-10 and 13-15 under 35 U.S.C. § 102(b) as being anticipated by Balasubramanian et al. Claim 1 and subsequent dependent claims have been amended to clarify the use of important colors in the present invention. The amended language is intended to make clear the purpose of the present invention and not intended to modify or restrict the scope of the invention. It is respectfully submitted that amended claim 1 is not anticipated by Balasubramanian et al. Amended claim 1 is representative of the present invention. An important feature of this claim is the provision of:

- “a) determining the distribution of colors in the input digital color image;
- b) supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors;”

The Examiner stated that Balasubramanian et al., hereinafter “Balasubramanian”, anticipated the method of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors, featured in the present invention. The Examiner cited page 286, column 2,

lines 46-49. Balasubramanian discloses the categorization of colors in a particular block or section of a histogram as either high, medium or low in activity. The activity of a section of the histogram was determined by the mean absolute deviation in the color vectors of that section (page 286, column 2, lines 19-22).

The present invention features a method of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors. The present invention is not based upon a categorization of the colors within the input image as does Balasubramanian. Rather the distribution of supplemented colors is pre-defined and independent of the input image. The pre-defined important colors, for example skin-tone colors, featured in the present invention will be deemed important in every image, not simply for images where skin-tone colors in the image are categorized in a particular way.

Furthermore, amended claim 1 of the present invention features supplementing the distribution of colors with the distribution of pre-defined important colors. Balasubramanian, as cited by the Examiner discloses a categorization of the colors based upon the image content. The present invention is not based upon the image but uses a pre-defined distribution of colors to supplement the colors in the image. Clearly, supplementing and categorizing are different. Applicants respectfully submit that Balasubramanian does not anticipate the feature of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors as set forth in amended claim 1 of the present invention. Moreover, there is no motivation in Balasubramanian to provide the present invention. Claims 1, 2, 5, 9, 10 and 13 are dependent upon amended claim 1 and subsequently, claims 1, 2, 5, 9, 10 and 13 are believed unanticipated.

Claims 14 and 15 were also rejected under 35 U.S.C. § 102(b) as being anticipated by Balasubramanian et al. Claim 14 has been amended to clarify the use of important colors in the present invention. The amended language is intended to make clear the purpose of the present invention and not intended to modify or diminish the scope of the invention. It is respectfully submitted that amended claim 14 is not anticipated by Balasubramanian et al. An important feature of amended claim 14 is the provision of:

“a) appending additional pixels to the input digital color image to form an enlarged input digital color image, where the color of the additional pixels is distributed according to the distribution of pre-defined important colors;”

As stated previously, Balasubramanian does not disclose the use of a distribution of pre-defined important colors. Applicant's believe that amended claim 14 is not anticipated by Balasubramanian and subsequently dependent claim 15 should also be allowed with claim 14.

The Examiner rejected claims 3, 4 and 18 under 35 USC § 103(a) as being unpatentable over Balasubramanian et al. as applied to claim 1 above. It is respectfully submitted that amended claim 1 sets forth unobvious subject matter and subsequently dependent claims 3, 4 and 18 are unobvious in light of Balasubramanian.

Balasubramanian discloses a color quantization algorithm that uses a prequantization step that partitions the RGB space into cubes of varying sizes. The cube sizes are determined by an image-dependent activity criterion that reflects the human observer's high sensitivity to quantization errors in smooth regions of the image. (Page 284, last paragraph).

Applicants submit that Balasubramanian does not suggest the present invention Balasubramanian discloses an image-dependent activity criterion that is substantially different from the pre-defined important colors featured in the present invention. Balasubramanian attempted to solve the problems of quantization errors by varying the cube sizes for the color vector merging step based upon an activity criterion that basically measured the frequency of occurrence of colors in the image. The method of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors in the present invention is not an image-dependent criterion. The pre-defined important colors would be deemed important independent of the histogram of colors in any particular input image. Applicants submit that Balasubramanian discloses an image-dependent activity criterion that does not suggest the prioritization of pre-defined important colors featured in the present invention and therefore the present invention is unobvious.

Further, Applicants submit that Balasubramanian is not capable of resolving all of the problems that the present invention solves. For example, in a

picture containing a face of a person in a small region of the picture or a face with many wrinkles, image-dependent palette selection methods such as the one disclosed in Balasubramanian, may leave large quantization errors in the area of the picture containing the persons face. Since it is likely that the person's face is an important part of the image, the present invention recognizes the problems associated with image-dependent palette selection in such instances and solves such problems by using the method of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors, which would typically include skin-tone regions.

Therefore, quantization errors are less likely to occur in such histograms using the method of supplementing with pre-defined important colors, such as skin-tone colors. It is respectfully, submitted that the method of detecting pre-defined important colors featured in the present invention recognizes and is capable of resolving problems previously unsolved by Balasubramanian. Applicant's believe that amended claim 1 sets forth unobvious subject matter, and subsequently, dependent claims 3, 4 and 18 are unobvious.

The Examiner rejected claims 6-8 under 35 USC § 103(a) as being unpatentable over Balasubramanian as applied to claim 1 and further in view of Balasubramanian et al. (U.S. Patent No. 5,432,893). Balasubramanian et al., hereinafter "Balasubramanian ('893)", discloses a quantization mechanism of sequential scalar quantization (SSQ). Although these claims include the use of a SSQ algorithm to determine a set of palette colors, the use of the SSQ algorithm in the present invention is dependent upon the unobvious subject matter of amended claim 1, which is not suggested by either reference. As previously discussed, the present invention features a method of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors, unobvious in light of the primary reference Balasubramanian. In fact, the present invention is also applicable in conjunction with any image-dependent palette generation method including the SSQ algorithm. These claims depend upon an allowable base claim and should also be allowed. Moreover, Applicants submit that the use of the SSQ algorithm disclosed in the dependent claims of the present invention is unobvious in light of amended claim 1.

The Examiner rejected claims 11 and 12 under 35 USC § 103(a) as being unpatentable over Balasubramanian as applied to claim 1 and further in view of Gentile et al. (Journal of Optical Society of America, 1990). Claims 11 and 12 are dependent upon independent amended claim 1. As previously discussed, Applicant's believe that amended claim 1 sets forth unobvious subject matter in light of the primary reference, Balasubramanian, and subsequently all dependent claims are unobvious.

Gentile et al., hereinafter "Gentile", discloses a method of evaluating the efficiency of quantization and halftoning algorithms when the image quality level is fixed in order to determine the number of bits (colors) required to produce the desired image quality. Gentile does not recognize the problems solved by the present invention, specifically the use of the multi-level halftoning technique in conjunction with the method of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors.

Further, there is no motivation to combine Balasubramanian and Gentile. Gentile discloses an evaluation of the efficiency of quantization and halftoning algorithms when the image quality level is fixed in order to determine the number of bits (colors) required to produce the desired image quality. Balasubramanian discloses a pre-quantization step to solve the problems of quantization errors by varying the cube sizes for the color vector merging step based upon a local activity criterion. Clearly, there is no motivation to combine these references. Even if there were motivation to combine these references, they would not teach the method of supplementing the distribution of colors in the input digital color image by a distribution of pre-defined important colors disclosed in amended claim 1 of the present invention.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this

application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



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Enclosure